



Green Technology

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ABSTRACT

Technology refers to the application of knowledge for human benefits. Green technology deals with using science and technology to protect the environment as well as curb the negative impacts of human involvement. It is any mode of technology that covers CO₂ emissions. Green technologies include green energy, green IT, green food, green, manufacturing, green business, green economics, green supply chain, green logistics, green building, and green nanotechnology. This paper provides a brief introduction to green technology.

Key Words: *green technology, sustainable technology, environmental technology, clean technology*

INTRODUCTION

There has been rapidly-increasing awareness of the environmental impact of mankind's modern lifestyle in recent years. This impact arises from pollution, consumption, and destruction of natural resources. This has led to greater awareness of the need for sustainable and environmentally-friendly practices. This awareness has led to the emergence of green technologies in recent years.

Technology refers to the application of knowledge for practical purposes. Green technology is one that takes into account the impact an invention has on the environment. Some people refer to green technology as sustainable technology, environmental technology, or clean technology. Here green technology is used to mean effort to promote sustainability and reduce greenhouse gas emissions. Green technologies and practices are those that lessen the environmental impact of a business's operations. As with any technology, the development of green technology requires investment and initiative to support development projects. It also requires encouraging the whole society to participate in the green technology

innovation and forming green consumption consciousness.

CONCEPT OF GREEN TECHNOLOGY

The term "green" denotes life, harmony, stability, neutralization of the negative. The concept of green is in the heart of creation. Everything around us is predominantly green. We depend on the green herbs, grass, trees, etc. for life [1]. The term "technology" refers to the application of knowledge for practical purposes. Green technology helps to reduce negative effects on the environment while improving productivity, efficiency, and operational performance of a given technology. The main goal of green technologies is to meet the needs of society in the way that avoids depleting or damaging natural resources on earth. The key components of green technologies are recycling, environmental remediation, and renewable energy sources.

- *Recycling:* Green technology helps manage and recycle waste material. Recycle objects are made of glass, metal, paper, and plastic. These materials are reusable and should be recycled to prevent further depletion of the earth's resources.
- *Environmental Remediation:* This involves removing contaminants from the soil, air, and water. It is the removal of pollutants or contaminants for the general protection of the environment.
- *Renewable Energy Sources:* Green technology includes the conversion of renewable resources to useful energy.

The four pillars of green technology are [2]: (1) Energy harvesting - This seeks innovative ways to extract useful energy from waste by-products, as well as to develop new technologies to maximize the harnessing of energy; (2) Environment -All human activities have an impact on the environment and we must conserve and minimize the impact; (3) Economy

- Enhancing the national economic development through the use of technology will assist us in building a strong and vibrant local community; and (4) Social – We improve the quality of life for all and emphasizes the importance of individual well-being, including full access to effective health care, housing, food, and education. Thus, green technology addresses social, economic, and environmental values.

GOING GREEN

Going green can help us come out of the present tough environmental problem. Easy ways to be greener include [3]:

- Implement recycling in the office
- Remember: Reduce, reuse, recycle, repair, and think
- If recycling already exists, make sure employees are aware
- Educate employees on what can and cannot be recycled (cardboard, plastics, glass fluorescents, and IT equipment)
- Purchase recycled paper
- Install water hippos in toilets (a device that sits in the cistern of the toilet and reduces water used with each flush) or use low-flow toilets
- Encourage employees to carpool or bike to work
- Turn off technology and/or appliances when not in use
- Buy LED, CFL (compact fluorescent bulbs) or other long lasting bulbs
- Try to repurpose old technology
- Have heating and air conditioning on when needed, make sure it's not going non-stop
- Go paperless
- Do more things electronically (ex: voting, filing taxes, and various tickets, and meetings)
- Ask boss about possibility of distant working
- Get rid of screen savers and allow products to go into sleep mode
- Order things online or walk / bike, instead of using up fuel
- Try to repair technology instead of replacing it entirely
- Buy a hybrid / electric car
- Use power saving modes for maximum efficiency on all devices

These simple ways can make a significant impact.

EXAMPLES OF GREEN TECHNOLOGY

Green technologies and practices are those which make an establishment's production processes more environmentally friendly. Several companies

worldwide have committed to establishing green business and manufacturing practices. These include IBM, Dell, Cisco, Hewlett-Packard, Johnson & Johnson, Intel, Nike, Wells Fargo, and Staples.

Green technologies and practices have been applied in several areas including green energy, green chemistry, green nanotechnology, and green buildings.

➤ *Green Energy:* This is perhaps the most urgent use of green technology. Energy is being conserved through the use of green technology. Currently, non-renewable resources make up 80 percent of the world's energy requirements, but they are not sustainable. Renewable energy sources include water, biomass, wind, solar, and geothermal. For example, a solar cell converts the energy in light into electrical energy. The development of green energy is the highest priority in many scientific endeavors [4].

➤ *Green chemistry:* This is also known as sustainable chemistry. It is a philosophy of chemical research and engineering that encourages the design of products and processes that minimize the use and generation of hazardous substances. Green chemistry applies to organic chemistry, inorganic chemistry, biochemistry, analytical chemistry, and physical chemistry [5].

➤ *Green nanotechnology:* This is one of the latest in green technologies. Nanotechnology involves the manipulation of materials at the atomic or nano scale. Green nanotechnology is the application of green chemistry and green engineering principles to nanotechnology. Materials are manipulated in ways that will transform the manufacturing industry.

➤ *Green Buildings:* The main benefit of building green is reducing a building's impact on the environment and significantly improving building performance. Using green technologies in building construction not only benefits the environment, but they can produce economically attractive buildings that are healthier for the occupants as well [4]. Using green roofs improved the energy performance of buildings because they provide higher thermal inertia, shading, and absorption of solar energy. Green buildings have the potential to substantially reduce energy consumption.

Other applications of green technology include water and waste management, green IT, green manufacturing, green business, green economics, green marketing, green supply chain, green logistics,

transportation, smart grid, agriculture, construction industry, and water supply.

ADVANTAGES AND DISADVANTAGES

The advantages of green technologies are often stated in comparison to conventional and more polluting technologies. Advantages of green technology include [7, 8]:

1. Does not emit anything detrimental into atmosphere
2. Brings economic profits to certain areas
3. Needs less maintenance
4. Uses renewable natural resources that never depletes
5. Slows the impacts of global warming by reducing CO₂ emissions
6. Ensures maximum utilization of IT resources in the enterprise
7. Diminishes the number of malignant wastes to the atmosphere
8. Protects our planet from global warming

The disadvantages of green technology include [7]:

1. High implementing costs
2. Lack of information
3. No known alternative chemical or raw material inputs
4. No known alternative process technology
5. Uncertainty about performance impacts
6. Lack of human resources and skills

BENEFITS AND CHALLENGES

The most important benefit in applying green technology is enhancing the quality of life by ensuring a more sustainable environment. Other benefits of green technology include recycling waste material, purifying of water, purifying the air, conserving energy, and rejuvenating ecosystems. Adoption of green technology can enhance a company's environmental reputation. Green technology is one of the fastest growing employment sectors. Jobs available for those who are passionate about conserving the environment.

Green technologies face some challenges. They are generally more expensive than the established baseline technologies aim to replace, because they have to account for the environmental costs. Selling green technologies has not been easy because it requires new paradigm of appreciation: cause consequence, cost benefit, etc. No change comes without some pain. A monopoly may continue to use a dirty production technology over a known, socially superior green technology.

CONCLUSION

Green technology has emerged as an important trend and development in the 21st century. Its importance has increased worldwide since the turn of the century. Its development will lead to global and sustainable powers that will impact our economics, societies, cultures, and way of life. Several business establishments have used at least one green technology or practice in order to make their production processes more environmentally friendly. More information on green technologies can be found in the book in [9].

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